The Watershed Extension Final paper

Name: **Elizabeth Reilly**

Title: **Environmental Issue- Cause Effect Solution project**

Focusing on the world's water crisis and water conservation.

GEMs: ?

Grades: 7th grade

Subjects: Science, Social Studies, Geography, World cultures.

GSE's met:

ESS1 (5-8) SAE–2

Explain the processes that cause the cycling of water

into and out of the atmosphere and their connections

to our planet's weather patterns.

ESS1 (5-8) POC –3

Explain how earth events (abruptly and over time)

can bring about changes in Earth's surface:

landforms, ocean floor, rock features, or climate

Duration: a few weeks

Group size: Part I is an individual project. Part III is a group project.

Setting: Classroom, computer lab, library

Part 1: Environmental Issue Project

Every year my students complete this project (see below). They choose an environmental topic to research and write about. The written essay is a Cause Effect Solution essay. They also present their findings to the class in a verbal presentation. In their presentation, they will also have a visual prop to enhance their presentation of the topic. To make a connection between my environmental unit and the new material I have learned from my watershed science class, I added an emphasis on Water Conservation and a study on the Global water crisis.

Rubric for original Environmental Issue Essay:

Goal: The student will have a better appreciation for Environment and the precious world we live in.
Objectives:

The student will:

- Analyze the environmental consequences of humans changing the physical environment.
- Compile research materials on one environmental issue.
- Write an essay on one environmental topic that is grammatically correct with an introduction, at least three support paragraphs (cause, effect, solution) and a conclusion.
- Develop and implement a personal plan or solution to your environmental topic and speculate as to how and why that plan (solution) might change the environment.
- Present your topic to the class. (Oral Presentation) In your presentation, you will need a visual prop.

Procedure:

1. the student is to choose one topic below that they are interested in researching.

2. The student will research the topic by collecting information from web sites and the library. The student is responsible for documenting all sources. (Refer to MLA bibliography/works cited format sheets)

3. The student is to write a CAUSE-EFFECT-SOLUTION Essay.

- What is the cause of this environmental issue?

For example: Acid Rain: Rainwater from the clouds is relatively pure. However as the rain falls through the atmosphere it picks up pollutants emitted from automobiles, factories, and other sources. Some of the pollution is in the form of sulfuric acid and/or nitric acid. Rainwater that is contaminated by these acids is called acid rain.
* * * * * * * * * * * * *Cause: Human Environmental Interaction

- What is the effect of this environmental issue?

For example: Acids have the power to corrode metal, rock, wood, or almost anything they contact. The facades of buildings, statues, bridges and other objects are easily attacked by acid rain and will eventually deteriorate. The soft, tender leaves of trees have virtually no protection against acid rain. Acid rain also contaminates the water it falls on, as in lakes and rivers. Given sufficient acid rain, fish in the lake will die because the acids will destroy their food supply.

- What is YOUR Solution for this environmental Problem?

For example: Remember Knowledge is Power! Voice your concern about Acid rain to your Local, State, Country and World leaders. Get involved with environmental groups (I.e., SAVE THE BAY) Come up with your own solution. Be Creative.

* * * * * * * * * * * * One Person can make a difference! * * * * * * * * * * * *

Product:

❑ The end product will be a Cause-Effect-Solution Essay. The essay should be two pages typed and
See Team A Writing Rubric

❑ In addition, a verbal presentation is required of researched material. A visual aid must accompany the presentation. The factual information presented to the class will be knowledge gained and assessed for all students. Accuracy of facts is necessary.

DUE Dates:

★ Rough Draft

★ Final Copy
★ Verbal Presentation /Visual Prop_____

Topics

1.Ozone Depletion
2.Global Warming
3.Greenhouse Effect
4.Air Pollution
5.Deforestation
6.Land Pollution
7.Ocean Pollution
8. Drinking Water Pollution

Part II: Water Conservation

Overview:

The world is about 75% water. Of that 75%, 97% of that water is ocean water. That leaves only 3% fresh water for possible human consumption. 2% of the available fresh water is frozen in the Polar Regions. Antarctica's Icecap is the largest supply of fresh water, representing nearly 2% of the world's total of fresh and salt water. The fresh water actually available for human use in lakes and rivers and the accessible ground water amount to only about one-third of 1% of the world's total water supply. One-third of 1% is scary when you think that humans cannot live without water after 3 days. Our population numbers keep rising which is putting a bigger demand for water. We all need to conserve.

At home experiment:

I begin my environmental basics with my students performing an experiment at home. I instruct my students to calculate the gallons of water it takes for their normal daily shower. If they have a shower with a bathtub, they are to plug their tub (stopping the water from exiting.) Continue to take their normal length shower. After take an old 2 gallon milk container and measure the gallons of water every day they use just for their shower. Students need to visualize the water that is being unconscientiously wasted. I will then connect their attention to the current events around the world and especially nationally regarding water shortages.

Classroom experiment: Demonstration

How much of the world water do we really have?

World of Water Demonstration

Students will be able to:

- Define vocabulary related to water conservation
- Summarize why not all the Earth's water is drinkable

- Discuss the different types of water on Earth
- Examine and calculate personal water use
- Formulate a personal water conservation plan
- Evaluate the effectiveness of water conservation plan

Materials needs

- 3-5-gallon aquarium
- 3 gallons of water
- Measuring cup (24-ounce)
- Green food coloring
- Two 6-ounce see-through containers
- Eye-dropper
- Sand

Step 1

Put 3 gallons of water in an aquarium. Explain that this water represents all the water on earth.

The students will infer what percentage of this water is while observing the water in the aquarium:

- Ocean
- Groundwater
- Rivers
- Ice caps/glaciers
- Freshwater lakes
- Inland seas/ salt lakes
- Atmosphere

Step 2

Using a measuring cup, the teacher removes 20 ounces of water from the aquarium. Using food coloring, color the remaining water in the aquarium. The dyed water represents the world's oceans. The water in the measuring cup represents all the water in the world that is NOT ocean water.

Pour 15 ounces of water from the measuring cup into clear container. This water represents ice caps and glaciers. Because it is in the form of ice, it is not readily available for use so it has to be separated from the world's supply of fresh water.

The remaining 5 ounces of water in the measuring cup represent the world's available fresh

water. Of this water, only a small percent of an ounce composes the world's freshwater lakes and rivers. Use an eyedropper to collect this water and place it into a student's hand.

The water remaining in the measuring cup, after removing ice caps and glacier water and freshwater lakes and rivers (about 4.5 ounces), is groundwater. Pour this water into a cup of sand and explain that this water is what is referred to as groundwater and that it is held in pore spaces of soil and cracks in bedrock.

Source for classroom demonstration: http://www.thirteen.org/h2o/

Water Conservation at home: The students will take this worksheet home to record their water usage daily. This will be a better indicator where they can start conserving at home.

Name: _____ **Date:** _____

H2O Diary: How Much Water Do You Use?

Hypothesis: How many gallons of water does the average person use per day?

_____

_____

_____

_____

Direction: This survey is to be conducted truthfully over the course of one week. Put a tally mark in the Times Per Day column very time someone living in your home does the activity.

Weekly Water Use Survey

Activity	**Times Per Day**							**Weekly Total**	**Estimated Amount of Water Used (in gallons)**	**Total Weekly Water Used**
	Sun	Mon	Tues	Wed	Thurs	Fri	Sat			
Toilet Flushing									* 5	
Short Shower (5-10 minutes)									* 25	
Long Shower (>10 minutes)									* 35	
Tub Bath									* 35	
Brushing Teeth (running water)									* 2	
Brushing Teeth (water turned off)									* 0.25	
Shaving									* 2	
Washing Dishes (running water)									* 30	
Washing Dishes (Filling a basin)									* 10	
Running a Dishwasher									* 20	
Washing Clothes									* 35	
Watering Lawn									* 300	
Washing Car									* 50	
								Total Weekly Water Use (gallons)	=	

Average Daily Water Use (gallons)	/7 =	
Average Individual Daily Water Use (gallons)	/ by number of people living at home =	

Part III: Global water crisis

I am a Social Studies teacher focusing on Geography and World cultures. To connect the students' Environmental topics and the water conservation awareness, I added a study on the world water crisis. I found a great lesson plan to incorporate into this unit. It is my hope that after studying these countries they will be more conservative with their own water usage.

Source: http://water.org/FileUploads/WPMidCurricFULL.pdf

Global water crisis mini unit.

Objective:
Students will research water crisis conditions for one of the following five countries: Bangladesh, Ethiopia, Honduras, India, or Kenya and record findings on the Global Water Crisis International Comparison Group Activity graphic organizer. Students will then report their findings to the class, who will then record the remaining information for the other four countries on their activity charts.
Lesson:
Students will be assigned to research one of the following nations that have received aid from Water Partners International: Bangladesh, Ethiopia, Honduras, India, or Kenya. Students will individually visit (http:// water.org). [Website instructions: From the main page click on world water crisis, then scroll down to the bottom of the page and click on Water Crisis in the Countries [we help], next under the left hand column heading "Where We Work" select the icon for the country you have been assigned to research.]
Students will individually complete the activity chart for the country they have been assigned. Students will then work in groups of four or five to organize and present information on the country assigned to their group.
Materials:
Internet access, Global Water Crisis International Comparison Group Activity graphic organizer, pencils or pens, and presentation materials such as index cards, PowerPoint, or overhead transparencies.
Optional Activity:
Students may work in groups to discuss the major water, health and sanitation issues of their assigned country and make 2-3 recommendations for improvement of water and sanitation conditions.
Water-Awareness Portfolio Entry:

Which one of the four countries that the class reported on would you most like to live in? Which of the countries would you least like to live in? Why?

Possible discussion question:

Why does more than one-third of the world's population not have access to clean water?

Global Water Crisis basic facts sheet

• Less than 1% of the world's fresh water (or about 0.007% of all water on earth) is readily accessible for direct human use.

• A person can live weeks without food, but only about three days without water.

• The interventions with the greatest impact on national development and public health are the provision of safe drinking water and the proper disposal of human waste.

• Water-related diseases are one of the leading causes of disease and death in the world. At any given time, half of the world's hospital beds are occupied by patients suffering from a water-related disease.

• Close to half of all people in developing countries suffer from a health problem caused by water and sanitation deficits.

• 2.6 billion people in the world lack access to proper sanitation resources.

• A person needs 4 to 5 gallons of water per day to survive.

• The average American individual uses 100 to 176 gallons of water each day.

• The average African family uses about 5 gallons of water each day.

• Millions of women and children spend several hours a day collecting water from distant, often polluted sources.

• Water systems fail at a rate of 50% or higher.

• Every $1 spent on water and sanitation creates on average another $8 in costs averted and productivity gained.

• Almost two in three people lacking access to clean water live on less $2 a day.

• Poor people who are likely to live in slum areas often pay 5-10 times more for per liter of water than wealthy people living in the same city.

• Every 15 seconds, a child dies from a water-related disease.

• At any given time, half of the world's hospital beds are occupied by patients suffering from a water-related disease.

• 1.8 million Children die each year from diarrhea – 4,900 deaths each day.

• Human health improvements are influenced not only by the use of clean water, but also by personal hygiene habits and the use of sanitation facilities.

National water crisis: My students cannot think about these far away countries as real. They think that is happening over there on the other side of the world, why should I care, it doesn't affect me here in RI. However, one of fifty states is under severe drought conditions. They are in a state of emergency with raging forest fires. California. The web site below explains the current situation in California, due to a 3 year drought. I would discuss with my students why this is happening. California's drought is directly connected to other topics that are being researched for their environmental issue project. (I.e. Global warming.) As I'm typing this there are major wildfires in Santa Barbara Ca. burning out of control. Million dollar homes are burning down in minutes. I would also state that RI is not immune to this type of crisis.

Why California is facing severe water challenges.

Water is in short supply for many cities, farms and businesses, and will remain so for the foreseeable future.

Drought conditions and environmental problems are reducing water deliveries to key regions of California. These regions will continue to see shortages even when normal rainfall returns.

Jobs are being lost in the hardest-hit areas, and growers are leaving thousands of acres unplanted and cutting back production of avocadoes, tomatoes, melons and other crops.

The state's population continues to grow, with 60 million Californians now expected by 2050.

Climate change is ushering in new uncertainties for our water system, and longer periods of drought are likely in the coming decades.

These challenges mean **we can no longer take a reliable water supply for granted**. State and local water managers are working now on long-term solutions, but in the meantime, there is an immediate need for Californians to reduce their water use.

Conservation is one of the key strategies of a comprehensive solution to the state's water challenges – and it's something we can all do today.

Conclusion:

I feel that it is my responsibility to be the force that opens the eyes of my students each year. This responsibility is a heavy one in my social studies curriculum. I have so much material to cover each year. It is my passion in life to protect and preserve our planet earth. I spend a great deal of my time showing the students what we all can do to protect planet Earth. I want to thank you for enhancing my Environmental Education over the past few months. It was a great learning opportunity for me.

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